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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/724,376

11/28/2003

Jie Liang

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EXAMINER

GHULAMALI, QUTBUDDIN

ART UNIT

PAPER NUMBER

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/12/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/724,376

Applicant(s)

LIANG, JIE

Examiner

Qutub Ghulamali

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the register for storing information cited in the claims must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claims 1, 2 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims 1 and 2, when taken as a whole merely recite a mathematical algorithm for computing channel estimation utilizing the equation disclosed in the disclosure, page 6, and as such fails to lead to a concrete and tangible result. A claim must fall into one of the § 101 classes, namely; process, machine, composition of matter and manufactures. A claimed channel estimation to conserve power is clearly not a process under § 101 because it is not a series of steps. The three other product classes require physical structure or material. A claimed algorithm for channel estimation has no physical structure, does not itself perform any useful, concrete and tangible result and, does not fit within the definition of a machine. A "composition of matter" covers all compositions of two or more substances, wherein a claimed estimation is not a matter, but an algorithm or computer program and therefore is not a composition of matter. As to "manufacture" the definition to mean "the production of articles for use from raw or prepared materials by giving it new forms, qualities, properties or combination whether by hand or by machinery, which a estimation as claimed does not have. The mathematical expression to compute channel estimation is an algorithm and does not fall within one of the four statutory classes of § 101. The

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"Interim Guidelines for examination of Patent Applications for Patent subject matter Eligibility" provides that for claims including such excluded matter to be eligible, the claim must be for a practical application and fall within the statutory classes exemplified. The claim fails to show that it meets the statutory classes of § 101. Hence it is concluded that the claims are non-statutory.

Claims 3-4 fail to cure the deficiency noted above in the base claims to which they depend from, are likewise rejected.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the preamble" and "the duration of the packet" in lines 2 and 3 respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim 2 recites the limitation "the preamble" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyons et al (6,922,549) in view of Keaney et al (US Pub. 2006/0193277).

Regarding claim 1, Lyons discloses conserving power in a WLAN receiver comprising:

a channel estimator with the preamble of each packet and storing (memory 737 is included for data buffering and program storage) and using said channel estimator values for the duration of the packet (the long and short preamble provides processing time values for SOP) (The IEEE-802.11a protocol includes a training sequence built on a preamble that provides sufficient information to allow frequency and timing estimation as well as channel estimation to enable a receiver at the start of packet (SOP) detection, is well known in the art) (col. 4, lines 56-67; col. 5, lines 1-15, 40-45). Lyons does not explicitly disclose enabling receiver channel estimator during the preamble. However, Keaney in a similar field of endeavor discloses enabling the receiver (channel estimator from its idle state) only when the SOP preamble is detected and the idle state is vacated (page 5, sections 0054, 0055). It would have been obvious to a person skilled in the art at the time of invention to enable the receiver channel estimator as

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taught by Keaney in the circuit of Lyons because it can provide safety against false start of packet triggers that would enable channel estimation start incorrectly.

As to claim 2, Lyons discloses conserving power in a WLAN receiver comprising: a channel estimator with the preamble of each packet (consists of a short and long preamble packet) and running pilot processing (col. 6, lines 34-47; fig. 6, modulated payload after the preamble) after the preamble of each packet to get off set error values from the channel estimation pilot processing values (The IEEE-802.11a protocol includes a training sequence built on a preamble that provides sufficient information to allow frequency and timing estimation as well as channel estimation to enable a receiver at the start of packet (SOP) detection, is well known in the art) (col. 4, lines 56-67; col. 5, lines 1-15, 40-45). Lyons does not explicitly disclose enabling channel estimator in a receiver during the preamble. However, Keaney in a similar field of endeavor discloses enabling the receiver (channel estimator from its idle state) only when the SOP preamble is detected and thereafter the idle state is vacated (page 5, sections 0054, 0055). It would have been obvious to a person skilled in the art at the time of invention to enable the receiver channel estimator as taught by Keaney in the circuit of Lyons because it can provide safety against false start of packet triggers that would enable channel estimation start incorrectly.

As to claim 3, Lyons discloses storing and using estimation values is inherently implied with the processing of preamble (col. 5, lines 44-46).

As per claim 4, Lyons discloses summing stored channel estimator values for the duration of the packet with said off set error values determined by the pilot processing (col. 6, lines 18-26, 34-67).

Regarding claim 5, WLAN receiver comprising:

an equalizer (element 815; col. 6, lines 35-39);

a channel estimator for detecting transmitted errors in a transmitted packet and providing equalization to said equalizer for the detected channel errors (col. 6, lines 34-47); and

response to the start of each packet for enabling said channel estimator during the preamble and thereafter disabling said channel estimator for the remainder of the packet and storing the estimated value for the duration of the packet.

Lyons does not explicitly disclose response to the start of each packet for enabling said channel estimator during the preamble and thereafter disabling said channel estimator for the remainder of the packet and storing the estimated value for the duration of the packet. Keaney, however, in a similar field of endeavor discloses enabling the receiver (channel estimator from its idle state) only when the SOP preamble is detected and thereafter the idle state is vacated (disabled) (page 5, sections 0054, 0055). It would have been obvious to a person skilled in the art at the time of invention to enable the receiver channel estimator at the start of packet (SOP) and storing the estimated value for the duration of the packet as taught by Keaney in the circuit of Lyons because it can provide safety against false start of packet triggers that would enable channel estimation start incorrectly.

As per claim 6, Lyons discloses a separate pilot processor for detecting off set errors from the channel estimation and providing off set correction to said equalizer for the whole data portion of the packet after the preamble (fig. 6; col. 6, lines 34-54).

As to claim 7, Lyons discloses stored channel estimator values for the duration of the packet is summed with said off set error values determined by the pilot processing (col. 2, lines 18-29).

Regarding claims 8-11, Lyons discloses equalizer includes a frequency domain equalizer (Fourier transformer 813 transforms time- domain samples to frequency domain samples; col. 6, lines 27-31).

Regarding claim 12, Lyons discloses channel estimator includes a decoding the status of the receiver state machine (col. 6, lines 35-47).

As to claim 13, Lyons discloses channel estimator and enabling said separate pilot processing equalizer for the whole data portion of the packet after the preamble includes decoding the status of the receiver state machine (fig. 6; col. 6, lines 27-67; col. 7, lines 1-23).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patents:

US Patent (7,151,759) to Ryan et al.

US Pub. (2002/0126768) to Isaksson et al.

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US Patent (7,120,427) to Adams et al.

US Patent (7,139,536) to Chiu.

US Pub. (2005/0208897) to Lyons et al.

US Pub. (2005/0095987) to Lyons et al.

US Pub. (2005/0026565) to Goldstein et al.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.

January 5, 2007.



MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER